

SOARING SEABIRDS

Grades 3-5



OBJECTIVES	Students will use art and communication skills to: <ul style="list-style-type: none">• Construct models of native seabirds in flight• Create a display illustrating the birds' various habitats• Describe how people can help endangered and threatened species to survive.
KEY CONCEPT	Electric lights have confused fledgling seabirds, causing them to fall during their flight from their mountain burrows to the sea. The cooperative efforts of island residents and government agencies are helping to save native seabirds from extinction.
MATERIALS	bird drawing (provided), for birds: two 8 1/2" x 11" sheets of card stock or heavy white paper for each bird, black crayons or felt-tip markers, scissors, tape, and string; for background scene: a large sheet of butcher paper and colored markers.
VOCABULARY	seabirds, fledgling, fall-out, predation, threatened species
SUBJECT AREAS	art and science
2005 HAWAII STATE CONTENT STANDARDS	
STANDARD	BENCHMARK
3.1.1	Pose a question and develop a hypothesis based on observations. (Section 5)
3.5.1	Describe the relationship between structure and function in organisms. (Section 2)
4.1.2	Differentiate between an observation and an inference (Sections 2 and 6)
4.3.1	Explain how simple food chains and food webs can be traced back to plants. (Section 2 and 3)
4.5.3	Describe how different organisms need specific environmental conditions to survive. (Section 3 & 6)
5.1.2	Formulate and defend conclusions based on evidence. (Section 1, 5 & 6)
5.3.1	Describe the cycle of energy among producers, consumers and decomposers (Section 3 and the 5.3.1 extension described at the end of the exercises.)

OVERVIEW:

In this activity students will cut out and construct models of a native seabird that nests on Kaua'i- the Newell's Shearwater. The models will be suspended from the ceiling at various heights depicting birds descending from their high elevation mountain burrows down to the sea. If desired, a background scene of burrow nests and the sea surface could be illustrated. [Another endemic seabird, the Hawaiian Petrel, formerly named Dark-rumped Petrel, could also be featured. It nests at high elevations on Maui and the Big Island and possibly on Kaua'i and Lāna'i. A fact sheet is available on the CWCS website: <http://www.state.hi.us/dlnr/dofaw/cwcs/index.html> and an illustration of the bird in flight can be found in "Seabirds of Hawai'i" (see references).]

BACKGROUND:

The Newell's Shearwater ('Ua'u Kani), one of Hawai'i's two endemic seabirds, is the subject of a success story that offers hope for threatened and endangered species. 'Ua'u Kani nest in mountain burrows high above the sea. The burrows may be used by the same pair of birds from year to year. During, the breeding season from May to November, one chick is reared in each burrow. Adult birds soar down to the sea each day to feed. They return to the burrow at sunset and regurgitate partially digested seafood, usually squid, to their hungry chicks.

Newell's Shearwaters are known to breed on Kaua'i, Hawai'i, and Moloka'i and were federally listed as Threatened in 1975, primarily because of predation and habitat loss. Chicks are often the target of predators such as rats and feral cats. Disturbances to Shearwater habitat are caused by development, destruction of ground cover, which conceals a burrow, and the introduction of less suitable alien plants. Lighting from streetlights, homes, athletic fields, and hotels pose a serious problem for Shearwaters. The birds, particularly the fledglings, are attracted to light during their first flight from the burrow. This attraction causes them to become disoriented, and they often crash into power lines and other obstructions. Fallen birds may suffer injuries from the impact or from predators.

Adult shearwaters apparently are not attracted to lights to the same degree as fledglings, but do collide with power lines. In 2003, Kaua'i Island Utility Cooperative completed shielding all street lights on Kaua'i but there remain many lights to attract fledgling shearwaters. Since 1978, the organization Save Our Shearwaters has banded and released about 23,000 shearwaters picked up by Kaua'i residents and brought to stations set up around the island. The program, run by conservation organizations (Department of Land and Natural Resources, The Nature Conservancy, and the U.S. Fish and Wildlife Service) alerts residents to the problem and directs them to take fallen birds to pick-up centers around the island. The fallen birds are collected each day and taken to a release site where they are banded and weighed. The birds then climb a ramp within a release pen and soar off to sea. Birds unable to climb the ramp are treated for injuries and released.

PROCEDURE:

1) Distinguish between birds that live in the forest or in urban areas and birds that live near the sea. Ask students to describe any bird that they see only at the beach. How are these birds different from birds they see inland? Some have webbed feet, longer beaks, longer wings, and fewer colors. Seabirds, such as the Hawaiian Petrel and Shearwaters, come ashore only to breed. They are distinguished from waterbirds, such as the Hawaiian Stilt and Coot, who live in Hawai'i's wetlands. Students may be more familiar with indigenous seabirds, such as the Iwa (Frigatebird) or the Fairy Tern.

2) Distribute the student worksheets illustrating body parts of the Newell's Shearwater. Review the body parts, summarizing the differences between seabirds and land-dwelling birds.

head and bill

Note the gland above the nostril where excess salt from drinking and feeding at sea is excreted. The bill is used for picking up food, preening- spreading oil from the oil gland to keep feathers waterproof, and for excavating burrows.

wings

The wings of seabirds are narrower, longer, and more pointed than land-dwelling birds which enables them to soar and glide on high winds at sea. (The Shearwater is named for its habit of dipping a wing tip while soaring on air currents close to the sea's surface. They seem to 'shear' or slice through the ocean as they search for food.)

color

Seabirds tend to be dark above and white below. The white underparts probably serve to make them less noticeable to fish.

legs and feet

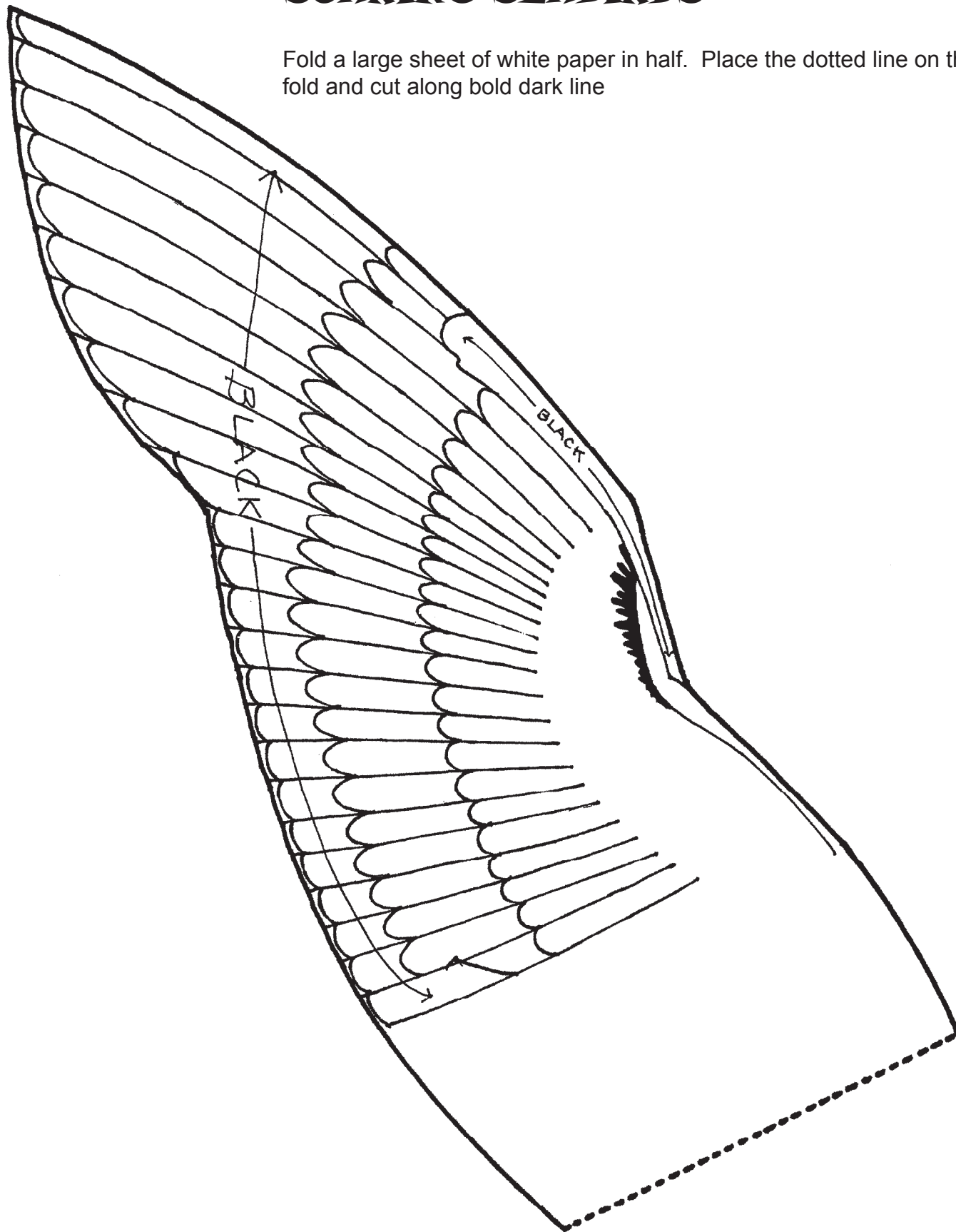
The legs are set far back on the body and feet are webbed. These are adaptations for swimming rather than walking. Shearwaters have difficulty walking on the ground and tend to shuffle or lurch along. Their claws are used to dig nesting burrows.

3) Have students, cut, color and construct models of the birds. If you wish to create background scenery of the bird's habitat, ask for volunteers to draw tunnels or burrows in the side of a cliff and draw the side of the mountain down to the sea. Downy chicks could be painted in the burrows and squid could be painted in the sea.

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SOARING SEABIRDS

Fold a large sheet of white paper in half. Place the dotted line on the fold and cut along bold dark line





NEWELL'S SHEARWATER
(‘A’o)

4) Cut strings of various lengths. Place the strings through the bodies of the birds and tape in place. Hang the birds with the shortest strings near the mountain burrows and, using increasingly longer lengths of string, arrange the birds so that they appear to be flying down to sea level.

5) Discuss the threatened status of the birds and reasons for their decline. See if students can think of ways to help the birds survive and then relate the rescue efforts that have been so successful.

6) In groups or individually, ask students to each pick a different seabird and research challenges to survival. Discuss the different challenges facing seabirds that nest close to shore (such as Wedge-tailed Shearwaters) versus high in the mountains (Newell's Shearwaters.) Refer to the open Country & Wetland Birds Poster and bird fact sheets.

EXTENSIONS:

Grade 3:

- 3.1.1 Pose a question and develop a hypothesis based on observations. Section 5
 - 1) Before starting this lesson, have students look at the DOFAW Open Country & Wetland Birds Poster. Have them write down one question that they have about the birds structure (i.e. why is the beak shaped the way it is? Or why are the tops of the wing light and the bottoms dark?)
 - 2) At the end of the lesson after they have learned a bit about the birds, have students try to come up with a hypothesis to answer their question. [Teachers: This is a good opportunity to write the definition of a hypothesis on the board and discuss (or review) the scientific process.]

Grade 4:

- 4.5.3 Describe how different organisms need specific environmental conditions to survive.
 - 1) Prior to randomly drawing tunnels, nests, and food sources on their map, have each student (or student pair) choose a bird to study more in-depth. Students should research the type of nest their species makes, their species' favorite foods, and their favored habitat. Teachers will want to alert students to the fact that they should understand why their bird needs specific conditions to survive. Students might need help with this.
 - 2) Students should then draw these nests and food types with as much detail as possible and place them in their island map.
 - 3) For a take home/in class assignment, students could write a bit about why they believe their bird has the described traits.

Grade 5:

- 5.3.1 Describe the cycle of energy among producers, consumers and decomposers.
 - 1) When completing step 3, students should draw the energy cycle [i.e. some shearwaters' food includes squid which eat gobies which eat micro-fauna (organisms too small to be distinguished without a microscope) which eat fungi and bacteria found on the ocean floor].
 - 2) Energy cycles can be posted up and students can give mini presentations about their energy cycle picture and what it means.

Other Suggestions

- Initiate a study of seabirds and waterbirds to familiarize students with birds that visit their island and birds that live in their island's wetlands. Note that wetlands are often the site of development, and that as habitat for our endangered native waterbirds, these areas need protection.